

**STATEMENT OF WORK (SOW)
FOR
MULTI-SCREEN DISPLAY CONTROLLER
AND PROJECTORS
FOR
UNITED STATES AIR FORCE
309TH MAINTENANCE WING (309MXW)
SOFTWARE MAINTENANCE GROUP (309SMXG/MXDDC)
14 DECEMBER, 2005**

1 BACKGROUND

The Human Engineering Development System (HEDS) is part of the Software Maintenance Group (309SMXG) located at the Ogden Air Logistics Center (OO-ALC), Hill Air Force Base, Utah. Among other responsibilities, SMXG supports all Operational Flight Program (OFP) modifications to the F-16 C/D Block 30 aircraft. HEDS is responsible for prototyping some OFP changes and then showing these prototypes in a flight simulator to pilots and others who make decisions about the OFP upgrades.

The committee that decides which upgrades to place in the F-16 hold a series of meetings where the prototypes are shown. The entire committee cannot fit within the simulation cockpit at one time. Instead, a combination of in the cockpit and briefing are used. The briefings combine PowerPoint presentations and live video repeats of what the pilot is seeing within the simulation cockpit. There are a number of different images that can be displayed for the panel.

2 OBJECTIVE

Because only a limited number of individuals can occupy the simulator at one time (only one is practical), in addition to the images presented to the pilot seated in the simulator, images will be presented to a larger audience using a video presentation wall in a semi-theater setting. These images will be the same as or similar to those seen by the pilot. In this semi-theater setting the members of a review committee can discuss what they're seeing while knowing that they're all discussing and seeing the same thing.

The theatre audience will be presented with several different images which require several projectors and a large screen. The images that are planned at this time include: 1) an OTW scene with HMD symbology; 2) a wide OTW view; 3) video repeats of two cockpit MFD displays; and 4) a birds-eye overview of the airspace where the pilot is

flying the scenario. This system is a Non-Typical design and it must be designed and built to support more options as they present themselves in the future.

The required IG computer system, dome screen, and Video Wall mentioned in this SOW are either purchased separately or are owned already, and are not themselves a part of this SOW. However; performance under this SOW will require some interfacing with those systems.

3 SCOPE

The scope of the Multi-Screen Display Controller and Projectors includes pre-award site surveys, equipment purchase and/or construction, system configuration, and on-site installation of the Commercial Off-The-Shelf (COTS) CRT projectors, initial alignment and calibration of the projectors, acceptance testing, training, technical support, documentation, and warranty.

The Multi-Screen Display Controller will need to be able to take the multiple input video feeds and display them in different windows, in multiple locations on the Video Wall.

The contractor is required to ensure all necessary video inputs can be properly displayed on the video wall using multiple projectors.

The Air Force recommends an on-site visit because of the non-typical design of the system. During the site visit, the contractor shall evaluate the site to determine how best to meet the requirements.

The contractor shall supply all parts including but not limited to: two (2) CRT projectors, mirrors (if necessary), the Multi-Screen Controller hardware and software, cabling, fasteners, and supports as necessary. The CRT projectors must be rear projectors to fit in a room that is 7 feet deep behind the video wall.

The contractor shall align the projectors to properly display on the screen.

4 CONTRACTOR QUALIFICATIONS

The following are items each bidding contractor should address in its proposal. This information will be used to assess the contractor's qualifications, and in selecting the winning proposal.

- 4.1 The contractor shall have an in-depth knowledge of multi-screen display controllers, projection systems and technologies.
- 4.2 The contractor must demonstrate that both the organization and proposed key personnel can successfully complete this project.

- 4.3 The contractor MUST indicate the availability of the key personnel who will be assigned to this task. Key personnel are all individuals who will be supporting this task in a primary capacity, whether full- or part-time.
- 4.4 The contractor should provide a list of “reference” installations. I.e., information (e.g., where, when, what, for who) about other installations it has performed which are of similar configuration and scope and which use equipment which is the same as or very similar to the equipment specified herein.
- 4.5 The contractor will provide a detailed layout of hardware design and software architecture for the multi-screen display controller and projection system.
- 4.6 The contractor will provide detailed drawings showing all of the following:
Throw distances, angles, mounting structure, raster size percent, mirror sizes, part numbers, blend region, lens specifications, etc.
- 4.7 Contractor must be a certified VDC Distributor. This is because we must use the VDC Marquee projectors.
- 4.8 The contractor will be asked to provide proof of insurance before contract award.
- 4.9 **PRE-AWARD VISIT**
On the scheduled day the contractor shall visit the site to ensure all aspects of the project are covered, and to evaluate any limitations or constraints. Available dates to visit the site are: December 20-23, 27-29, Jan 3-6 and 8-12th. Please contact the Hill AFB COTR Brent Jarvis at 801-586-6467 to schedule a date and time. The site survey observations will be represented in the offerors technical proposal. This includes all limitations, and constraints/obstructions.

5 SPECIFIC TASKS

The contractor shall be directly responsible for ensuring the accuracy, timeliness, and completion of all tasks assigned under this SOW. Specifically, the contractor shall perform all tasks described in this section.

5.1 MATERIALS

Purchase, build, or cause to be built all materials listed in section 6.1.

5.2 SHIPPING

The contractor shall cause all parts and supplies shipped to the installation site to be shipped to:

ATTN: Brent Jarvis, 309 SMXG/MXDDC
801-586-6467
Bldg 1515 Rm 241
6137 Wardleigh Rd.
Hill AFB, UT 84056-5843.

5.3 CONTRACTOR PRE-INSTALLATION REQUIREMENTS

The contractor's proposal shall identify all requirements it may have for performing the installation. This may include, but is not limited to: site preparation, electrical power, material handling equipment, environmental conditions.

5.4 ON-SITE MULTI-SCREEN DISPLAY CONTROLLER AND PROJECTORS REQUIREMENTS

The contractor's proposal shall identify any requirements for the multi-screen display and projection environment and facility. This may include, but is not limited to: electrical power, placement within the facility, heating / cooling.

5.5 MULTI-SCREEN DISPLAY CONTROLLER AND PROJECTORS INSTALLATION

The contractor shall perform on-site installation of the Multi-Screen Display Controller (including applicable cabling) and software, and all other installation processes which are necessary for a functioning multi-screen display controller. Also the contractor shall install the projectors and ensure the multi-screen controller works across the projectors.

5.6 OPERATIONAL

The contractor shall mount, and adjust the controller on-site as necessary to achieve a visually correct display in all windows necessary on the Video Wall.

5.7 VIEW ALIGNMENT

The contractor shall mount, align, and adjust the projectors on-site as necessary to achieve a visually seamless interface between displays.

5.8 ACCEPTANCE TESTING

The contractor shall perform acceptance testing on-site to validate system capability. See section 7 for details.

5.9 OPERATION INSTRUCTION / TRAINING

The contractor shall provide on-site system use, maintenance, and trouble shooting instructions after acceptance testing.

5.10 TECHNICAL SUPPORT

The contractor shall provide technical support as specified in section 6.**Error! Reference source not found.**0.

6 DELIVERABLES & DELIVERY SCHEDULE

The contractor shall deliver all of the deliverables specified in section 6.1 according to the schedule specified in section 6.2.

6.1 DELIVERABLES

6.1.1 HARDWARE MODULE(S) FOR THE MULTI-SCREEN DISPLAY CONTROLLER

The Multi-Screen Display Controller must be capable of 16 or more video inputs displayed across three (3) projectors. The system must be capable of receiving input signals ranging from up to 1600 X 1200 pixels resolution and down to 640 X 480 pixels. It must be compatible with NTSC/PAL composite, S-Video, Y, and Pb Pr component video input formats. It must also be able to sync on green and separate composite sync. The majority if not all inputs will be computer generated.

Each video input will be displayed in independent output windows that can be positioned, sized at user selected values for output on the projector videos. The system must be capable of updating multiple video inputs at a rate of at least 60 frames per second. Output signals will be configurable for side-by-side or overlapping displays as discussed in the Projectors section.

There will be only one control desk within full view of the screen (see Figure 3 - HEDS Theater Room Layout). The display controller hardware can be split into two locations, the control instrumentation at the control desk and the remaining hardware can be placed in the screen room. The display controller will only control the video wall display.

6.1.2 SOFTWARE FOR THE MULTI-SCREEN DISPLAY CONTROLLER

The system should provide software for easy configuration of the windows to include positioning, sizing, and video sources to the windows. There needs to be independent control of image position, scaling, pan and zoom, and parameters, such as, brightness, contrast etc. for each window.

6.1.3 PROJECTORS

Requires Two (2), with an option for a third, VDC Marquee 9500LC Ultra projectors with lenses setup for rear projection. (Note: the system is designed for thee (3) projectors; the screen is sized for three images. Budgetary concerns are limiting us to two projectors at this time.) CRT projectors are selected due to superior screen resolution and suitability for flight simulation images. In addition, these projectors are to serve as

backups/spares for the dome projectors, so they must be of the same type as the dome projectors.

The projectors must be installed in a room behind the video wall which is 83 inches deep (see Appendix). The vendor should assume there are small variations in this distance and not design such that variations would cause focus or other problems.

These are the minimum specifications the projectors must meet:

Optics requirements: High definition. Up to 12 line pairs per mm resolution.

Resolution: Up to 2048 X 1536 ANSI pixels.

Brightness: CRT Type: 9" electromagnetic focus

The projector system shall display images in two modes, a) side by side with no overlap and b) with a ~10% overlapping blend area. In side-by-side mode, the size of the projected images can be either 90" by 72" (5:4) or 90" by 67.5"(4:3). Three images of this width fills the 270" width of the screen.

In overlapping mode, each image will be 96" by 72" (4:3). With two blend regions this yields a 270" by 72" combined image (the two blend regions are about 9" each). The overlap area must be blended because three separately generated simulator images must appear as on large image.

(For informational purposes only, the screen which was purchased separately is a DA-LITE 10398 & 94160 72" X 269" VA DA-TEX screen, Lace and Grommet, Series 200 L&G Frame, with pro-trim, 84" X 281" OD. Rigid rear projection screen.)

6.1.4 MIRRORS

Three (3) mirrors will be used to reflect the video from the projectors onto the screen. The mirrors are used to achieve rear projection. There is 7 feet from the back wall of the room to the screen. We currently have a third projector which will use the third mirror.

6.1.5 SUPPORT STRUCTURE

The contractor shall construct and supply a support structure which will firmly hold the projectors and mirrors in place. If the mirrors are mounted in an upward-facing position, the mounting shall include a means of protecting the reflective surfaces from dust when not in use.

6.1.6 CABLING AND CABLING INFRASTRUCTURE

For each projector, the contractor shall provide one video cable of the appropriate type from the Projectors to the Multi-Screen Controller, and all needed power cables. The contractor shall supply all associated cabling infrastructure (e.g., supports, conduit, ducts, wall plates, terminations) needed to connect the projectors to the applicable power outlets and display generating devices. The cabling and infrastructure shall allow for easy/convenient reconfiguration. The contractor shall also provide video cabling for 10 channels from the Dome and WAC simulators to the Multi-Screen Controller.

6.1.7 MISCELLANEOUS

The contractor shall supply all other associated components necessary for an operational projection/screen system.

6.1.8 DOCUMENTATION

The contractor shall provide all applicable documentation for the use and maintenance of the system. This documentation shall be provided in PDF and/or Microsoft Word electronic file formats, or other suitable electronic formats with approval from the Contracting Officer's Technical Representatives (COTR).

6.1.9 WARRANTY

The contractor shall warranty the Multi-Screen Display Controller and Projectors (including all supplied parts) against defects in materials and workmanship. The base warranty shall begin on the date of final acceptance and shall be for a period of 12 months or longer. Extended warranties shall be quoted as an option.

Factory/OEM warranties whose periods exceed the base warranty period shall be honored for their full length of time. Each bidding contractor shall specify in its proposal whether the contractor will honor/service the factory/OEM warranties beyond the base warranty period, or if the contractor will transfer the factory/OEM warranties to the government at the end of the base warranty period. If the latter, then such warranties shall be considered deliverables.

Warranty service shall include the following:

6.1.9.1 On-site response time by next business morning.

6.1.9.2 System parts repair/replacement within 24 hours, exclusive of weekends and holidays.

6.1.9.3 The contractor shall stock at its business location critical components for support and repair.

6.1.10 TECHNICAL MAINTENANCE SUPPORT

The contractor shall provide up to four (4) site visits, up to 9 hours each, during the base warranty period. Response time shall be as specified for warranty service. Visits may be for any system operation issue, including adjustment and training, as required. Visits which are, or turn out to be for warranty service shall not count as technical support visits.

6.2 DELIVERY SCHEDULE

Item #	Description	WBS #	Prior Approval Required	Draft Due Date	Final Due Date (no later than)
1	Contract Award by GovWorks		Yes, by HEDS	Due with proposal	
2	All parts delivered by Contractor		No	NA	6 Wks
3	All parts assembled by Contractor		No	NA	8 Wks
4	Pass Acceptance Test		Yes	NA	9 Wks
5	Training		Yes	NA	Within 2 weeks after acceptance testing completion.

7 INSPECTION AND ACCEPTANCE CRITERIA

Final inspection and acceptance of all deliverables and associated installation and operation shall be performed at the place of delivery by the COTR in conjunction with the contractor.

7.1 GENERAL ACCEPTANCE CRITERIA

General quality measures as set forth below shall be applied to each work product received from the contractor under this SOW.

7.1.1 ACCURACY

Products shall be accurate in presentation, and technical content.

7.1.2 CLARITY

Documentation shall be clear and concise. Any/All diagrams shall be easy to understand and be relevant to the operation and maintenance of the equipment.

7.1.3 FORMAT

Documentation shall be submitted in an electronic format/medium mutually agreed upon prior to submission.

7.1.4 TIMELINESS

Deliverables shall be submitted on or before the respective due date specified in this SOW, or be submitted in accordance with a later scheduled date determined by the Government.

7.1.5 FUNCTIONAL PERFORMANCE TEST PLAN

It isn't practical to write a detailed test plan until after the contract is awarded. As such, after award, and in conjunction with the COTR, the contractor shall develop a detailed acceptance test plan and test procedures, which shall be a separate document. The test plan shall cover the following aspects:

- 7.1.5.1 Each deliverable shall be addressed and it shall be demonstrated that, as delivered, it meets the applicable requirement(s). This will include visual inspection of hardware and demonstration of software capabilities as necessary.
- 7.1.5.2 If a test shows that a requirement is not met, the contractor shall generate a discrepancy report and document a plan to correct the discrepancy, and then make the correction, and re-test.
- 7.1.5.3 The COTR may decide that a discrepancy need not be corrected. The contractor may also petition that a discrepancy correction be delayed or eliminated. The COTR will be the approval authority for such petitions.
- 7.1.5.4 The full and complete acceptance of all deliverables shall be by mutual written agreement between the contractor and the COTR.

8 TRAVEL & OTHER DIRECT COSTS (ODCs)

8.1 TRAVEL

Local and/or long-distance travel will be required. It is estimated there will be one week of travel or less for one individual. Accordingly, the contractor shall include anticipated travel costs in the cost proposal. The contractor shall be reimbursed for actual allowable, allocable, and reasonable travel costs incurred during performance of this effort in accordance with the Federal Travel Regulations currently in effect on the date of travel.

8.2 OTHER DIRECT COSTS (ODCs)

The government will pay no costs beyond that of the agreed FFP contract.

9 GOVERNMENT FURNISHED EQUIPMENT (GFE) & GOVERNMENT FURNISHED INFORMATION

9.1 GOVERNMENT FURNISHED EQUIPMENT (GFE)

The contractor shall have full access to GFE to perform the duties on the project while performing duties in government space. The Government shall furnish the supporting GFE, as required, to complete the contract. The GFE will consist only of hoists or jacks

to move and/or temporarily support materials. Electric power at the installation site will also be supplied by the government.

9.2 GOVERNMENT FURNISHED INFORMATION (GFI)

The contractor shall be furnished pertinent information and other documentation or material required to carry out the tasks described herein, to include interface information required to integrate the Multi-Screen Display Controller and Projectors with associated display screen and IG computer systems.

10 PLACE OF PERFORMANCE

Tasks identified as “on-site” shall be performed in and around room 239, 6135 Wardleigh Rd., Hill AFB, UT.

11 PERIOD OF PERFORMANCE

The period of performance for this task is date of award for a period of 11 weeks.

12 TYPE OF CONTRACT

Firm Fixed Price.

13 SECURITY

A security clearance is preferred but not required in performance of this contract. Contractor personnel without security clearance must/will be escorted by cleared government personnel at all times while in on-site secure areas. If contractor personnel have appropriate clearance, the contractor may/should obtain unescorted access to the building for such personnel by delivering a facility visit request to the building’s Facility Security Officer (FSO).

14 DATA USE, DISCLOSURE OF INFORMATION AND HANDLING OF SENSITIVE INFORMATION

Information made available to the contractor by the Government for the performance or administration of this effort shall be used only for those purposes and shall not be used in any other way without the written agreement of the Contracting Officer.

All data received, processed, evaluated, loaded, and/or created as a result of this delivery order shall remain the sole property of the Government unless specific exception is granted by the Contracting Officer.

15 POINTS OF CONTACT

All contract questions and concerns shall be directed to the Government Contracting Administrator who is identified, with contact information, in section 15.1. The Contracting Officer (CO) is the only individual with the authority to amend this contract.

15.1 CONTRACT ADMINISTRATION

Department of the Interior, National Business Center/
GovWorks Federal Acquisition Center
Attn: Mary Carver
381 Elden Street, MS2500
Herndon, Virginia 20170-4817
(703) 787-1340 – Voice
(703) 787-1106 – Fax
Email address: Mary.Carver@mms.gov

15.2 CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE (COTR)

15.2.1 PRIMARY

Prior to award: TBD

15.2.2 _ALTERNATE

Prior to award: TBD

16 INVOICING

The Contractor shall develop a payment schedule based on deliverables, which will be reviewed by both the COTR and contracting officer. If payment schedule is acceptable to the Government, **the contractor shall bill based on deliverables.**

Within 30 days after final acceptance, the final and full scheduled payment will be made.

16.1 INVOICE INSTRUCTIONS

16.1.1 ELECTRONIC INVOICE SUBMISSION

For GovPay information, **invoice submission**, and online training, please go to **www.govpay.gov** . The GovPay Help Desk is prepared to answer your questions. Please contact them at **HelpDesk@govpay.gov** or call the GovPay Team's phone number at 703-787-1200.

17 OTHER ADMINISTRATIVE CONSIDERATIONS

17.1 HOURS OF WORK

Hours of work are flexible but normal on-site business hour staffing shall cover 6:00 a.m. to 4:30 p.m., Monday through Thursday and 6:00 a.m. to 3:30 p.m., every other Friday beginning January 6, 2005 (excluding Federal Holidays). Additional time in the evening may be scheduled in advance. The COTR and the contractor must mutually agree upon all deviations from this schedule not mentioned herein. Work conducted outside these hours shall be conducted at the contractor's site or may be negotiated by the Project Task Leader with the COTR.

Contractor personnel will be escorted on-site as provided in section 13.

17.2 GOVERNMENT HOLIDAYS

The following Government holidays are normally observed by Government personnel: New Years Day, Martin Luther King's Birthday, Presidential Inauguration Day (metropolitan DC area only), President's Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day, Christmas Day, and any other day designated by Federal Statute, Executive Order, and/or Presidential Proclamation.

17.3 CONTRACT MANAGEMENT

The Contractor shall be responsible for managing and overseeing the activities of all Contractor personnel, as well as subcontractor efforts used in performance of this contract. The Contractor's management responsibilities shall include all activities necessary to ensure the accomplishment of timely and effective support, performed in accordance with the requirements contained in the SOW. Resumes submitted for employees assigned to perform under this SOW shall contain documented experience directly applicable to the functions to be performed. Further, these prior work experiences shall be specific and of sufficient variety and duration that the employee is able to effectively and efficiently perform the functions assigned.

17.3.1 PROJECT MANAGER, CO, AND COTR MEETINGS

The Contractor's Project Manager shall meet with the COTR and/or Contracting Officer (CO) as necessary to maintain satisfactory performance and to resolve other issues pertaining to Government/Contractor procedures. At these meetings, a mutual effort will be made to resolve any and all problems identified. Written minutes of these meetings shall be prepared by the Contractor, signed by the Contractor's designated representative, and furnished to the Government within two (2) workdays after the subject meeting.

18 PERSONNEL PERFORMANCE / REPLACEMENT

- 18.1 The contractor shall provide a resume for each individual assigned to work on this effort.
- 18.2 Key personnel assigned to this contract shall not be removed.
- 18.3 The Government reserves the right to judge the technical skill and competence of the individual and, with written notification, to require the individual's replacement if the individual's qualifications or performance are judged deficient at any time.
- 18.4 The Government reserves the right to judge the qualifications and acceptability of any individual proposed by the contractor for any position, and may, with written notification, require the contractor to replace an individual whose qualifications and suitability are judged deficient.
- 18.5 The Government requires the contractor to identify key personnel for the total period of the project. The execution of project tasks shall be subject to the precise assignment of specific individuals identified as key personnel. The contractor must ensure the continued assignment of personnel from project start to project finish. In the event an individual become incapacitated or leaves the company, it is the responsibility of the contractor to have qualified and/or cleared (if required) individuals on staff to accomplish the task with a minimal learning period.
- 18.6 For temporary and/or permanent replacement personnel, the contractor shall provide a resume for each individual two weeks prior to that individual reporting for work on this effort.

19 DATA RIGHTS

- 19.1.1.1 Under the provisions of the Rights in Data General Clause (52.227-14), the Government reserves all rights, including copyrights, distribution rights, and other rights for all documents, data, or software developed in the performance of this task.

20 APPENDIX

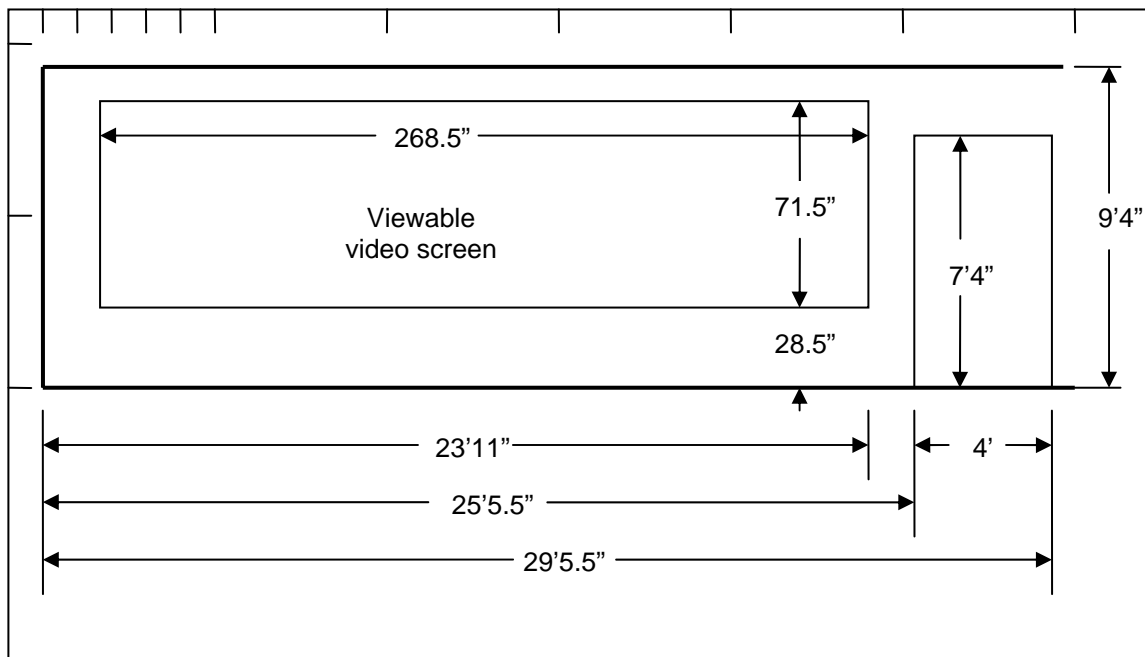


Figure 1 Video Wall Detail (roughly to scale)

The room behind the Video Wall is 7 feet back-to-front and 30+ feet left-to-right (extending from the left edge shown above to well beyond the doorway on the right).

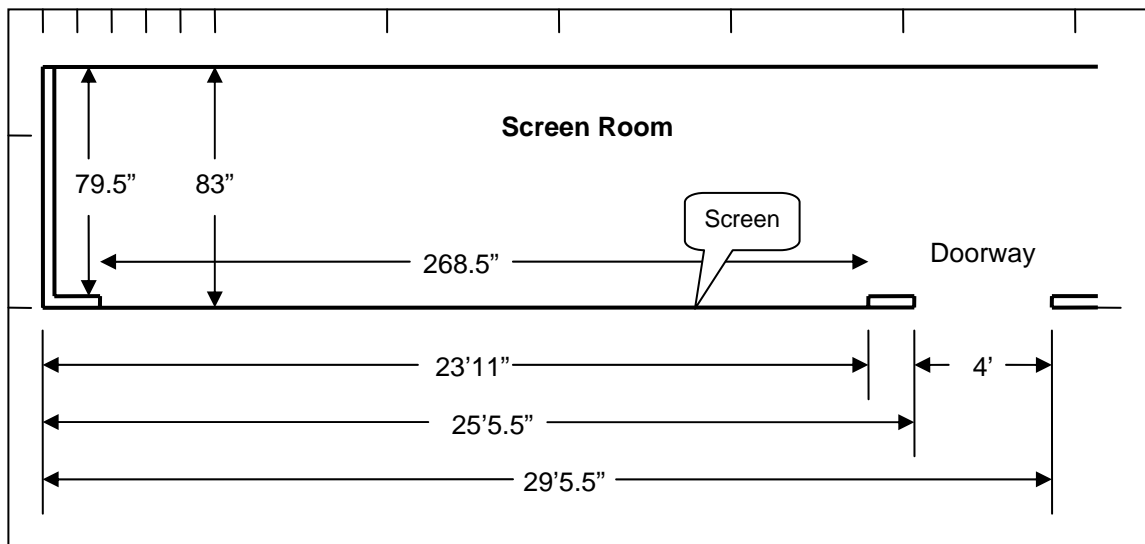


Figure 2 Video Wall Room immediately behind the video wall (Plan view)
The ceiling height is 9' 4" in this room.

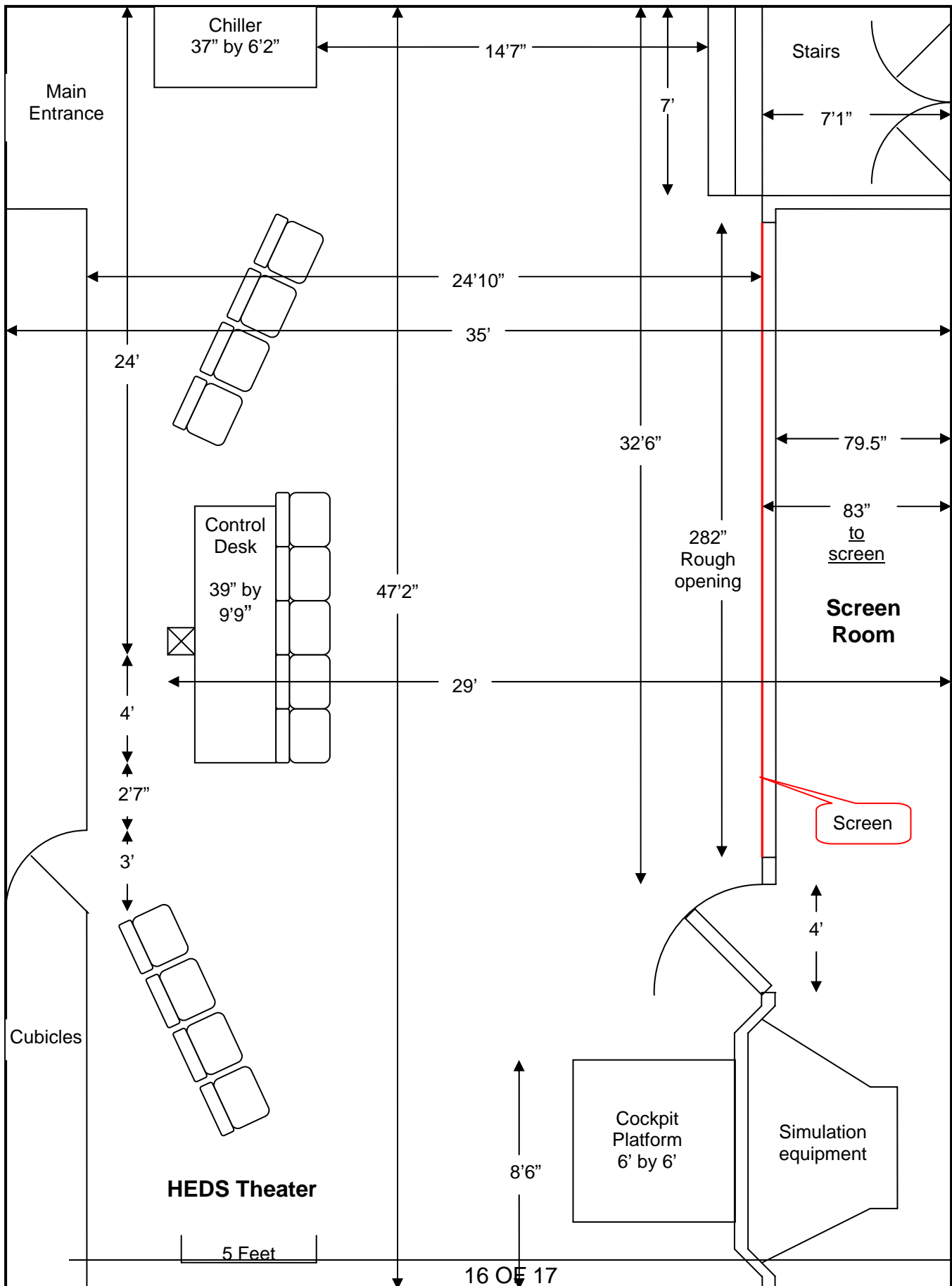


Figure 3 - HEDS Theater Room Layout

The HEDS theater room has both fluorescent and incandescent lighting. The fluorescent lighting is equally spaced throughout the room with 15 fixtures. There are four incandescent spot lights on a dimmer switch generally centered in the room. A few chairs were added to the layout to give a feel for the arrangement; however, it does change depending upon function.

(Note: in the drawing, all measurements are to the nearest inch, lines are drawn is to the nearest 0.5 feet, and the ceiling is a constant 9'4".)